

What is claimed is:

1. A method of conformance-testing a software implementation with a software specification, the method comprising:

applying the software implementation and the software specification to produce a CT
5 enabled implementation wherein nondeterministic choices of the software specification
result in assigning a corresponding choice of the CT enabled implementation to a variable;
and

the CT enabled implementation comprising a test that the variable comprises one of
the nondeterministic choices of the software specification.

10 2. The method of claim 1 further comprising:

the CT enabled implementation comprising a test that the variable conforms to a
condition on the nondeterministic choice specified in the software specification.

15 3. The method of claim 1 further comprising:

the CT enabled implementation comprising at least one first operation to carry out
when the variable comprises one of the nondeterministic choices of the software
specification; and

the CT enabled implementation comprising at least one second operation to carry out
20 when the variable does not comprise one of the nondeterministic choices of the software
specification.

4. The method of claim 1 further comprising:
compiling the software implementation from a first high-level language into an
intermediate language;
compiling the software specification from a second high-level language into the
5 intermediate language; and
producing the CT enabled implementation in the intermediate language.

5. The method of claim 1 wherein applying the software implementation and the
software specification to produce a CT enabled implementation further comprises:

10 including in the CT enabled implementation instructions of the software
implementation to synchronize the state of variables of the software implementation with the
state of variables of the software specification.

6. The method of claim 1 wherein applying the software implementation and the
15 software specification to produce a CT enabled implementation further comprises:

including in the CT enabled implementation instructions of the software
implementation to provide the choice of the CT enabled implementation corresponding to
the nondeterministic choice of the specification.

20 7. A method of conformance-testing a software implementation with a software
specification, the method comprising:

producing a software object organized such that each step of the software specification has a corresponding code section in the software object; and

the software object comprising at least one instruction which, when executed by a computer system, causes an identification of a mandatory call comprised by the software specification to be stored in a memory of the computer system.

8. The method of claim 7 further comprising:

the software object comprising at least one instruction which, when executed by the computer system, causes a test that the state of a CT enabled implementation conforms to the software specification during the mandatory call.

9. The method of claim 7, further comprising:

the CT enabled implementation comprising at least one instruction which, when executed by the computer system, causes a section of the software object to be executed prior to the CT enabled implementation performing the mandatory call, the section of the software object to be executed corresponding to a step of the software specification comprising the mandatory call.

10. The method of claim 7 further comprising:

modifying the software comprising the mandatory call method with instructions which, when executed by the computer system, cause instructions of the software object to

be executed to test that the state of the CT enabled implementation conforms to the software specification during execution of the mandatory call method.

11. The method of claim 7 wherein applying the software implementation and the software specification to produce a CT enabled implementation further comprises:
including in the CT enabled implementation instructions of the software implementation to synchronize the state of variables of the software implementation with the state of variables of the software specification.

12. An article comprising:
a machine-readable medium comprising instructions to generate a CT enabled implementation of a software specification, the instructions, when executed by a computer system, resulting in:

applying a software implementation and the software specification to produce the CT enabled implementation wherein nondeterministic choices of the software specification result in assigning a corresponding choice of the CT enabled implementation to a variable;
and

the CT enabled implementation comprising a test that the variable comprises one of the nondeterministic choices of the software specification.

13. The article of claim 12 wherein the instructions, when executed by the computer system, result in:

the CT enabled implementation comprising a test that the variable conforms to a condition on the nondeterministic choice specified in the software specification.

14. The article of claim 12 wherein the instructions, when executed by the
5 computer system, result in:

the CT enabled implementation comprising at least one first operation to carry out when the variable comprises one of the nondeterministic choices of the software specification; and

the CT enabled implementation comprising at least one second operation to carry out
10 when the variable does not comprise one of the nondeterministic choices of the software specification.

15. The article of claim 12 wherein the instructions, when executed by the computer system, result in:

15 compiling the software implementation from a first high-level language into an intermediate language;

compiling the software specification from a second high-level language into the intermediate language; and

producing the CT enabled implementation in the intermediate language.

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16. The article of claim 12 wherein the instructions, when executed by the computer system to apply the software implementation and the software specification to produce a CT enabled implementation, result in:

including in the CT enabled implementation instructions of the software implementation to synchronize the state of variables of the software implementation with the state of variables of the software specification.

17. The article of claim 12 wherein the instructions, when executed by the computer system to apply the software implementation and the software specification to produce a CT enabled implementation, result in:

including in the CT enabled implementation instructions of the software implementation to provide the choice of the CT enabled implementation corresponding to the nondeterministic choice of the specification.

18. An article comprising:

a machine-readable medium comprising instructions to generate a CT enabled implementation of a software specification, the instructions, when executed by a computer system, resulting in:

producing a software object organized such that each step of the software specification has a corresponding code section in the software object; and

the software object comprising at least one instruction which, when executed by a computer system, causes an identification of a mandatory call comprised by the software specification to be stored in a memory of the computer system.

5 19. The article of claim 18, wherein the instructions, when executed by the computer system, result in:

the software object comprising at least one instruction which, when executed by the computer system, causes a test that the state of the CT enabled implementation conforms to the software specification during the mandatory call.

10 20. The article of claim 18 wherein the instructions, when executed by the computer system, result in:

the CT enabled implementation comprising at least one instruction which, when executed by the computer system, causes a section of the software object to be executed prior to the CT enabled implementation performing the mandatory call, the section of the software object to be executed corresponding to a step of the software specification comprising the mandatory call.

15 21. The article of claim 18 wherein the instructions, when executed by the computer system, result in:

modifying the software comprising the mandatory call method with instructions which, when executed by the computer system, cause instructions of the software object to

be executed to test that the state of the CT enabled implementation conforms to the software specification during execution of the mandatory call method.

22. The article of claim 18 wherein the instructions, when executed by the
5 computer system, result in:
including in the CT enabled implementation instructions of the software
implementation to synchronize the state of variables of the software implementation with the
state of variables of the software specification.

10 23. An apparatus comprising:
a processor; and
a machine-readable medium comprising instructions to generate a CT enabled
implementation of a software specification, the instructions, when executed by the
processor, resulting in:
15 applying a software implementation and the software specification to produce the CT
enabled implementation wherein nondeterministic choices of the software specification
result in assigning a corresponding choice of the CT enabled implementation to a variable;
and
the CT enabled implementation comprising a test that the variable comprises one of
20 the nondeterministic choices of the software specification.

24. The apparatus of claim 23 wherein the instructions, when executed by the computer system, result in:

the CT enabled implementation comprising a test that the variable conforms to a condition on the nondeterministic choice specified in the software specification.

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25. The apparatus of claim 23 wherein the instructions, when executed by the computer system, result in:

the CT enabled implementation comprising at least one first operation to carry out when the variable comprises one of the nondeterministic choices of the software

10 specification; and

the CT enabled implementation comprising at least one second operation to carry out when the variable does not comprise one of the nondeterministic choices of the software specification.

15 26. The apparatus of claim 23 wherein the instructions, when executed by the computer system, result in:

compiling the software implementation from a first high-level language into an intermediate language;

20 compiling the software specification from a second high-level language into the intermediate language; and

producing the CT enabled implementation in the intermediate language.

27. The apparatus of claim 23 wherein the instructions, when executed by the computer system to apply the software implementation and the software specification to produce a CT enabled implementation, result in:

including in the CT enabled implementation instructions of the software implementation to synchronize the state of variables of the software implementation with the state of variables of the software specification.

28. The apparatus of claim 23 wherein the instructions, when executed by the computer system to apply the software implementation and the software specification to produce a CT enabled implementation, result in:

including in the CT enabled implementation instructions of the software implementation to provide the choice of the CT enabled implementation corresponding to the nondeterministic choice of the specification.

29. An apparatus comprising:

a processor; and

a machine-readable medium comprising instructions to generate a CT enabled implementation of a software specification, the instructions, when executed by a computer system, resulting in:

producing a software object organized such that each step of the software specification has a corresponding code section in the software object;

the software object comprising at least one instruction which, when executed by a computer system, causes an identification of a mandatory call comprised by the software specification to be stored in a memory of the computer system; and

the software object comprising at least one instruction which, when executed by the
5 computer system, causes a test that the state of the CT enabled implementation conforms to the software specification during the mandatory call.

30. The apparatus of claim 29 wherein the instructions, when executed by the computer system, result in:

10 the CT enabled implementation comprising at least one instruction which, when executed by the computer system, causes a section of the software object to be executed prior to the CT enabled implementation performing the mandatory call, the section of the software object to be executed corresponding to a step of the software specification comprising the mandatory call.

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31. The apparatus of claim 29 wherein the instructions, when executed by the computer system, result in:

modifying the software comprising the mandatory call method with instructions which, when executed by the computer system, cause instructions of the software object to
20 be executed to test that the state of the CT enabled implementation conforms to the software specification during execution of the mandatory call method.

32. The apparatus of claim 29 wherein the instructions, when executed by the computer system, result in:

including in the CT enabled implementation instructions of the software implementation to synchronize the state of variables of the software implementation with the

5 state of variables of the software specification.